

CPC COOPERATIVE PATENT CLASSIFICATION

C21C PROCESSING OF PIG-IRON, e.g. REFINING, MANUFACTURE OF WROUGHT-IRON OR STEEL; TREATMENT IN MOLTEN STATE OF FERROUS ALLOYS ([refining metals in general C22B 9/00](#))

C21C 1/00 Refining of pig-iron; Cast iron

- C21C 1/02 . Dephosphorising or desulfurising
- C21C 1/025 .. {[Agents used for dephosphorising or desulfurising](#)}
- C21C 1/04 . Removing impurities other than carbon, phosphorus or sulfur
- C21C 1/06 . Constructional features of mixers for pig-iron
- C21C 1/08 . Manufacture of cast-iron
- C21C 1/10 . Making spheroidal graphite cast-iron
- C21C 1/105 .. {[Nodularising additive agents](#)}

C21C 3/00 Manufacture of wrought-iron or wrought-steel

C21C 5/00 Manufacture of carbon-steel, e.g. plain mild steel, medium carbon steel or cast steel {[or stainless steel](#)}

- C21C 5/005 . {[Manufacture of stainless steel](#)}
- C21C 5/02 . Crucible furnace process {(C21C 5/005 takes precedence)}
- C21C 5/04 . Manufacture of hearth-furnace steel, e.g. Siemens-Martin steel {(C21C 5/005 takes precedence)}
- C21C 5/06 .. Processes yielding slags of special composition
- C21C 5/28 . Manufacture of steel in the converter {(C21C 5/005 takes precedence)}
- C21C 5/285 .. {[Plants therefor](#)}
- C21C 5/30 .. Regulating or controlling the blowing
- C21C 5/305 ... {[Afterburning](#)}
- C21C 5/32 ... Blowing from above (C21C 5/35 takes precedence)
- C21C 5/34 ... Blowing through the bath (C21C 5/35 takes precedence)
- C21C 5/35 ... Blowing from above and through the bath
- C21C 5/36 .. Processes yielding slags of special composition
- C21C 5/38 .. Removal of waste gases or dust
- C21C 5/40 ... Offtakes or separating apparatus for converter waste gases or dust

- C21C 5/42 .. Constructional features of converters
- C21C 5/44 ... Refractory linings
 - C21C 5/441 {Equipment used for making or repairing linings}
 - C21C 5/443 {Hot fettling; Flame gunning}
 - C21C 5/445 {Lining or repairing the taphole}
- C21C 5/46 ... Details or accessories
 - C21C 5/4606 {Lances or injectors}
 - C21C 5/4613 {Refractory coated lances; Immersion lances}
 - C21C 5/462 {Means for handling, e.g. adjusting, changing, coupling}
 - C21C 5/4633 {Supporting means}
 - C21C 5/464 {Trunnion bearings}
 - C21C 5/4646 {Cooling arrangements}
 - C21C 5/4653 {Tapholes; Opening or plugging thereof}
 - C21C 5/466 {Charging device for converters}
 - C21C 5/4673 {Measuring and sampling devices}
 - C21C 5/4686 {Vehicles for supporting and transporting a converter vessel}
 - C21C 5/4693 {Skull removal; Cleaning of the converter mouth}
 - C21C 5/48 Bottoms or tuyères of converters
 - C21C 5/50 Tilting mechanisms for converters
- C21C 5/52 . Manufacture of steel in electric furnaces ([C21C 5/005](#) takes precedence); electric heating per se [H05B](#))
 - C21C 5/5205 .. {in a plasma heated furnace}
 - C21C 5/5211 .. {in an alternating current (AC) electric arc furnace}
 - C21C 5/5217 ... {equipped with burners or devices for injecting gas, i.e. oxygen, or pulverulent materials into the furnace}
 - C21C 5/5229 .. {in a direct current (DC) electric arc furnace}
 - C21C 5/5241 .. {in an inductively heated furnace}
 - C21C 5/5247 ... {processing a moving metal stream while exposed to an electromagnetic field, e.g. in an electromagnetic counter current channel}
 - C21C 5/5252 .. {in an electrically heated multi-chamber furnace, a combination of electric furnaces or an electric furnace arranged for associated working with a non electric furnace}
 - C21C 5/5264 .. {Manufacture of alloyed steels including ferro-alloys}
 - C21C 5/527 .. {Charging of the electric furnace}
 - C21C 5/5294 .. {General arrangement or layout of the electric melt shop}
 - C21C 5/54 .. Processes yielding slags of special composition
- C21C 5/56 . Manufacture of steel by other methods ([making liquid steel by direct processes C21B 13/00](#)){[C21C 5/005](#) takes precedence}
 - C21C 5/562 .. {starting from scrap}
 - C21C 5/565 ... {Preheating of scrap ([apparatus for preheating scrap in general F27D 13/002](#))}
 - C21C 5/567 .. {operating in a continuous way}

- C21C 7/00** **Treating molten ferrous alloys, e.g. steel, not covered by groups [C21C 1/00](#) to [C21C 5/00](#)(treating molten metals during moulding [B22D 1/00](#), [B22D 27/00](#); remelting ferrous metals [C22B](#))**
- [C21C 7/0006](#) . {Adding metallic additives}
- [C21C 7/0025](#) . {Adding carbon material}
- [C21C 7/0037](#) . {by injecting powdered material}
- [C21C 7/0043](#) . . {into the falling stream of molten metal}
- [C21C 7/005](#) . {using exothermic reaction compositions}
- [C21C 7/0056](#) . {using cored wires}
- [C21C 7/0068](#) . {by introducing material into a current of streaming metal}
- [C21C 7/0075](#) . {Treating in a ladle furnace, e.g. up-/reheating of molten steel within the ladle}
- [C21C 7/0081](#) . {Treating and handling under pressure}
- [C21C 7/0087](#) . {Treatment of slags covering the steel bath, e.g. for separating slag from the molten metal}
- [C21C 7/04](#) . Removing impurities by adding a treating agent
- [C21C 7/06](#) . . Deoxidising, e.g. killing
- [C21C 7/064](#) . . Dephosphorising; Desulfurising
- [C21C 7/0645](#) . . . {Agents used for dephosphorising or desulfurising}
- [C21C 7/068](#) . . Decarburising
- [C21C 7/0685](#) . . . {of stainless steel}
- [C21C 7/072](#) . . Treatment with gases ([C21C 7/06](#), [C21C 7/064](#), [C21C 7/068](#) take precedence)
- [C21C 7/076](#) . . Use of slags or fluxes as treating agents ([C21C 7/06](#), [C21C 7/064](#), [C21C 7/068](#) take precedence)
- [C21C 7/10](#) . Handling in a vacuum
- C21C 2005/00** **Manufacture of carbon-steel, e.g. plain mild steel, medium carbon steel or cast steel {or stainless steel}**
- [C21C 2005/28](#) . Manufacture of steel in the converter {([C21C 5/005](#) takes precedence)}
- [C21C 2005/36](#) . . Processes yielding slags of special composition
- [C21C 2005/363](#) . . . Slag cements
- [C21C 2005/366](#) . . . Foam slags
- [C21C 2005/42](#) . . Constructional features of converters
- [C21C 2005/44](#) . . . Refractory linings

- C21C 2005/445 {Lining or repairing the taphole}
- C21C 2005/446 Dry linings
- C21C 2005/448 Lining wear indicators
- C21C 2005/46 . . . Details or accessories
- C21C 2005/4606 {Lances or injectors}
- C21C 2005/4626 Means for cooling, e.g. by gases, fluids or liquids
- C21C 2005/466 {Charging device for converters}
- C21C 2005/4666 for charging with organic contaminated scrap
- C21C 2005/4673 {Measuring and sampling devices}
- C21C 2005/468 Means for determining the weight of the converter

- C21C 2005/52 . . . Manufacture of steel in electric furnaces ([C21C 5/005](#) takes precedence); electric heating per se [H05B](#))
- C21C 2005/5211 . . . {in an alternating current (AC) electric arc furnace}
- C21C 2005/5223 . . . with post-combustion
- C21C 2005/5229 . . . {in a direct current (DC) electric arc furnace}
- C21C 2005/5235 . . . with bottom electrodes
- C21C 2005/5258 . . . with crater formed by down-melting of scrap or charge through electrode or lance
- C21C 2005/527 . . . {Charging of the electric furnace}
- C21C 2005/5276 . . . with liquid or solid rest, e.g. pool, "sumpf"
- C21C 2005/5282 . . . with organic contaminated scrap
- C21C 2005/5288 . . . Measuring or sampling devices

- C21C 2007/00** **Treating molten ferrous alloys, e.g. steel, not covered by groups [C21C 1/00](#) to [C21C 5/00](#)(treating molten metals during moulding [B22D 1/00](#), [B22D 27/00](#); remelting ferrous metals [C22B](#))**

- C21C 2007/0006 . . . {Adding metallic additives}
- C21C 2007/0012 . . . Lead
- C21C 2007/0018 . . . Boron

- C21C 2007/0025 . . . {Adding carbon material}
- C21C 2007/0031 . . . being plastics, organic compounds, polymers

- C21C 2007/0056 . . . {using cored wires}
- C21C 2007/0062 . . . with introduction of alloying or treating agents under a compacted form different from a wire, e.g. briquette, pellet

- C21C 2007/0093 . . . Duplex process; Two stage processes

- C21C 2100/00** **Exhaust gas**

- C21C 2100/02 . . . Treatment of the exhaust gas

C21C 2100/04 . Recirculation of the exhaust gas

C21C 2100/06 . Energy from waste gas used in other processes

C21C 2200/00 Recycling of waste material

C21C 2250/00 Specific additives ; Means for adding material different from burners or lances

C21C 2250/02 . Hot oxygen

C21C 2250/04 . Liquid gas

C21C 2250/042 . . Liquid oxygen

C21C 2250/06 . Hollow electrode

C21C 2250/08 . Porous plug

C21C 2300/00 Process aspects

C21C 2300/02 . Foam creation

C21C 2300/04 . Avoiding foam formation

C21C 2300/06 . Modeling of the process , e.g. for control purposes ; CII

C21C 2300/08 . Particular sequence of the process steps